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Conceptualizing Robotic Agency

Social Robots in Elder Care in Contemporary Japan

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ABSTRACT

Japan is a hyper-aging society, and its government is encouraging robotic solutions to address elder care labor shortage. Therefore, authorities have adopted an agenda of introducing social robots. However, increasing numbers of people in Japan are becoming emotionally attached to anthropomorphic machines, and their introduction into elder care may thus be perceived as contentious. By exploring human engagement with social robots in the care context, this paper argues that rapid technological advances in the twenty-first century will see robots achieve some level of agency, contributing to human society by carving out unique roles for themselves and by bonding with humans. Nevertheless, the questions remain of whether there should be a difference between humans attributing agency to a being and those beings having the inherent ability to produce agency and how we might understand that difference if unable to access the minds of other humans, let alone non-humans, some of which are not even alive in the classical sense. Using the example of an interaction between an elderly woman and a social robot, we engage with these questions; discuss linguistic, attributed, and inherent agencies; and suggest that a processual type of agency might be most appropriate for understanding human-robot interaction.

Keywords: attributed agency; emotional attachment; inherent agency; Japan; Kohn Eduardo; linguistic agency; machine learning; nursing home; Pepper; social robots.

1. INTRODUCTION

In April 2019, I (Aronsson) conducted field research in a nursing home in downtown Tokyo with approximately 150 elderly patients (Aronsson

2021). During my first visit, I noticed an elderly woman, Eriko, sitting in the corner of an entertainment room. She looked younger than her age, and at 75, she was healthy and had full cognitive capacity. She was deep in conversation with a robot and did not appear to be bothered by my presence. As I entered the room, I noticed that they were talking about what she had eaten and what her plans were for the afternoon. "You know, Pepper", Eriko told the robot, "today I feel content because I'm here with you. You make me happy".

It surprised me how naturally the conversation flowed between Pepper and Eriko. Eriko sustained eye contact with Pepper, and her body language and gestures when interacting with the robot were similar to those she would have used if she had been talking to a human. She interacted naturally with Pepper for approximately 10 minutes, during which time no other resident or caregiver disturbed them. One of the caregivers told me that, at first, Pepper was not very popular, and some of the residents actively objected to its presence (Aronsson 2020). In fact, when they met Pepper, they were not only indifferent but also actively hostile. One of the caregivers questioned how Eriko could be interacting so comfortably with the robot when it did not actually care about her: "It's just a puppet. It's quite disconcerting, I think, but we all pretend it's natural".

We open this special issue with the aim of expanding the discussion on nonhuman agency beyond the realm of living entities by asking how we can – or even should – conceptualize the agency of social robots. Recent multispecies ethnographic works have challenged the anthropocentric understanding of agency and have found agency among nonhumans, most notably nonhuman animals. A more radical school has even argued against a "biotic prejudice" and suggested that aliveness is not necessarily a prerequisite for showing agency (Helmreich 2011; Tsing 2012; Das 2013; Kohn 2013; Haraway 2014; Barker and Jane 2016). For example, anthropologists have described in great detail how most societies also attribute agency to nonliving nonhumans, such as spirits, ancestors, the dead, and gods. In this understanding, a spirit or ghost is alive and expresses agency through the bodies and voices of the living. If the dead were truly dead, they would not be of interest to us (Figal 2000; Motta 2019; Rambelli 2019). Taking this approach a step further, some researchers even extend the term "liveliness" to "chemical species", such as rocks and weather systems (van Dooren *et al.* 2016, 4). Using actor network theory, for example, it would be no problem to describe social robots as actants that have agency (Latour 2005).

However, should there not be a difference between humans attributing agency to a being and these beings having an inherent ability to pro-

duce agency? How would we grasp the difference if we cannot access the minds of other humans, let alone those of nonhumans, some of which are not even alive in the classical sense? This paper uses the example of the interaction between Eriko and the social robotic device named Pepper to engage with these questions. We suggest that elderly people can develop an emotional attachment to such devices by attributing agency to them. We argue that robots, as their machine-learning routines grow more sophisticated, will eventually interact in such an insightful way with humans that the dichotomy between attributed and inherent nonhuman agency will become meaningless.

Before we proceed, there are two caveats we need to briefly address: first, there is a large body of literature in other disciplines, such as cognitive science, artificial intelligence (AI), or robotics, about "artificial agents" (or of data-driven agency), which fails to even consider the idea that agency is in any way limited to living beings or humans. In fact, artificial agency is a central concept within those disciplines. We sidestep this fact since, in this paper, we argue from an anthropological perspective and use agency in a different sense. Second, our concept of agency also excludes nonhuman agency pertaining to legal persons; for instance, schools, corporations, universities, and churches. These are all agents that can do things (e.g., sign contracts) and are bound by obligations. Even though there are persons behind those nonhuman agencies, it is the legal person rather than the human who is judged responsible and punished or forced to comply. We acknowledge these types of nonhuman agency, but we do not discuss them in further detail.

2. Emotional attachment to anthropomorphic machines

Humanoid robots are still rare in most Western countries. However, in Japan, their usage has increased drastically in recent years. As a hyperaging society with one of the highest life expectancies in the world, Japan is currently undergoing a demographic transition that Western nations have yet to experience, showing us possible avenues for our own future. As the population has aged, the workforce has shrunk, leaving the increasing elderly Japanese population with an insufficient number of caregivers to meet their needs (Aronsson 2020). The Japanese Ministry of Health, Labour, and Welfare estimates that by 2025, there will be a shortage of approximately 400,000 care workers in Japan and that, despite a 2019

immigration law that grants visas to foreigners in 14 different sectors (including nursing care), the current legislation will result in adding only a fraction of the needed care workers (Hamaguchi 2019). Hoping that robots will fill this growing gap in the workforce, Japanese authorities have sought to introduce robotic devices that can perform some of the needed work. As the example above shows, nursing homes are increasingly using robots to assist with care work. While service robots have many functionalities in assisting the elderly and caregivers with daily living activities (such as bathing, toileting, and eating), their exteriors are often functional and do not resemble familiar biological forms. Social robots, on the other hand, with their often-cute appearance, resemble humans or nonhuman animals and fulfill a very different function, as they are designed to support the elderly by speaking, listening, and providing a source of companionship. They have been built to become our companions by being "able to communicate and interact with us, understand and even relate to us, in a personal way" (Breazeal 2002, 1).

Advancements in intelligent machines are redefining how people interact with technology (Lukács 2020), and as anthropomorphic robots proliferate, Japanese society is increasingly experiencing the phenomenon of people growing emotionally attached to anthropomorphic machines such as social robots, which include holographic, two-dimensional, and augmented-reality partners. With the continued proliferation of sophisticated electronic devices, this rising phenomenon of emotional bonding with artificial devices will expand both in Japan and globally (Aronsson 2020). Emotional technologies provide material conditions for experimenting emotionally with artificial forms of life, and these platforms let users build beyond what is technically possible by imagining what is alternatively desirable. Emotional machine platforms thus not only drive industry but also diversify intimacy, serving as experimental sites in speculative fiction for feeling and living otherwise (White and Galbraith 2019, 2). Part of this trend is that social robots are primarily marketed as part of *otaku* (youth) culture, such as Azuma from Gatebox Inc. (White and Galbraith 2019). Other Japanese artificial companions, such as Lovot and Aibo, target the general population.

Despite the enthusiasm with which the Japanese government is encouraging robotic solutions to solve the elder care labor shortage, the introduction of social robots into the realm of care might be considered contentious. In Japan, there are currently approximately 30,000 robotic care devices in use – both service and social – amounting to roughly one device per 50 elderly residents in institutionalized care facilities (Ministry of Health, Labour, and Welfare 2018). The potential problem is that

while these devices may fulfill all the outwardly necessary requirements that are essential for the provision of care, they can only express algorithms that imitate feelings (Breazeal 2002; Dumouchel and Damiano 2017; Turkle 2017). These machines speak and appear to listen, and by interacting with them, we appear to attribute a humanistic nature to objects that have none.

The widespread circulation of social robots in many facets of Japanese life suggests a relatively high acceptance of these devices compared to Western countries. In Japan, religion and science are widely regarded as compatible and even synergistic; the nonhuman world can be accommodated conceptually through the traditions of animism – the spirits inherent in objects – and Buddhism, which offers a dualistic yet complementary understanding of the self in relation to the external world (Aguilera *et al.* 2018; Robertson 2018). In Buddhism, familiar objects that cannot merely be thrown away are given memorial services, an experience that allows them to be remembered both aesthetically and emotionally, particularly when such services involve the cremation of objects that can be burned (Rambelli 2007). Notably, however, the science historian Yulia Frumer (2018) articulated a different perspective in arguing against animism, which is that what the Japanese perceived as unnatural and artificial in the literary trope of man-made humans from the 1910s were not machines but rather flesh-and-blood human beings – those ensnared in social and labor structures, devoid of creativity, and doomed to endless and pointless work. Thus, it was neither the structure nor the way of coming into being that defined what was natural versus what was unnatural or artificial, but rather the mode of being.

If the mode of being, rather than their artificial origins, is what makes social robots more acceptable in Japan than elsewhere, we have to better understand precisely what this mode of being entails. Japanese social robotics has largely focused on developing robots that can form long-term relationships with humans; thus, robots are not solely machines that perform tasks but instead become social actors within human environments (important to note that this is not pertinent to Japanese social robotics but to social robotics in general). Their mode of being, so to speak, is to mimic social behavior in a realistic way when interacting with humans (or, in some cases, even nonhumans). Social robots might project a certain aliveness through their anthropomorphic form and movements, as robot developers intentionally exploit the human tendency to anthropomorphize objects by giving them human-like features to enhance the believability of the mimicked social behavior (Damiano and Dumouchel 2018).

The emotions that these social robots activate in human-robot relationships in Japan might enable novel and original forms of human affect. Equipping the robot's algorithmic model of emotion with a psychological model of emotion creates the capacity to interact emotionally with humans based on what engineers think is ideal or to ethically model emotions suited for the activity of human-robot interaction. These "social", human-like qualities of social robots appear to be intended as tools for easing the social exchanges between robots and humans. As robotics companies are increasingly building mass market technologies for the specific purpose of connecting emotionally with humans, especially in Japan, we need to analyze how the body's capacity to feel and to connect with others – human or otherwise – is generated and being transformed today on a social, discursive, and technological level (White 2020; White and Katsuno 2021).

AI and robotics may augment and amplify human potential, as they can assist humans in various tasks such as care work. Deep learning has provided the basis for much of the rapid progress in AI in recent years, as both biological and synthetic intelligence have been transformed by neural networks. With cognitive abilities obtained through the implementation of deep learning, robots have in recent years moved beyond machines that simply increase productivity toward more complex reasoning, making them seem increasingly human-like.

Social robots offer seemingly elegant solutions to the challenges of care work by streamlining them and providing the elderly with a steady or constant form of companionship. Such robots represent new epistemic possibilities of caregiving that reflect on abiotic nonhuman agency that contrasts with the actual human companionship that they are seemingly replacing, which might be considered, by some elderly people, their relatives, and caregivers, to be a more authentic experience (Aronsson 2020; 2021, forthcoming). Even so, we cannot claim that this form of care and companionship involves more pretense than a human-only interaction, as humans are used to pretense and often treat expressed feelings as genuine to maintain social situations (Goffman 1959; Bourdieu 1984; Cavell 1999). As machines become more accurate in simulating the semantics of human interaction, we might accept their authenticity in the same way we accept that our human partners are emotionally devoted to our well-being – or perhaps we will always suspect the falseness of the former as much as we believe in the genuineness of the latter. The human capacity to reconcile failed or imperfect presentations of the self by others may lie at the root of our ability to accept machines as intentional caregivers despite knowing that the machines are programmed to act "as if" they care (Seligman 2008, 8).

In this way, the most interesting questions about social robots are not necessarily about the abilities these machines have and whether they possess intelligence or emotions but rather about the vulnerabilities *we* have and the emotions that these machines evoke in people (Turkle 2017). Addressing these new ways of interacting with social robots reveals how the introduction of a nonhuman mind and an artificial nature pushes the boundaries of a human-only interaction and, as such, belongs to the discourse on multispecies entanglements.

3. New intimacies with the social robot Pepper at a Japanese nursing home

Let us now return to the nursing home, where we encountered Eriko and Pepper for the first time. This nursing home, which is average in size by Japanese standards, had introduced several robotic care devices through a government-subsidized program. One of these devices is Pepper (*Fig. 1*), a humanoid robot that is relatively well known in Japan.

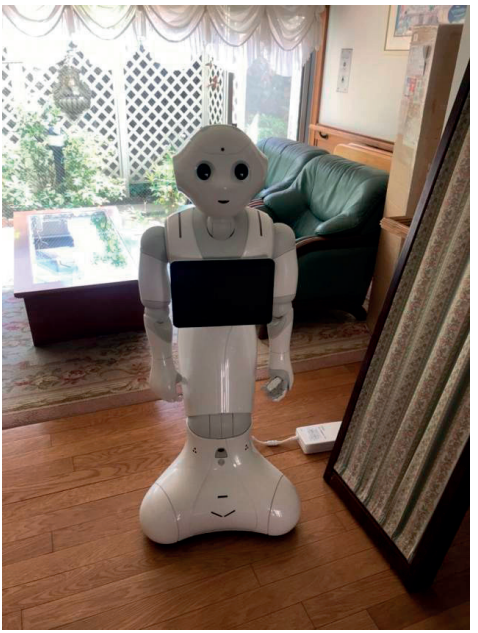

Figure 1. – Picture of Pepper in the Japanese nursing home (© Anne Aronsson).

This brand of robot is often seen in shopping malls and airports and is mainly deployed to give directions and to greet and entertain people. Pepper was produced through the collaborative efforts of Aldebaran Robotics and SoftBank Mobile, which aimed to develop a robot capable of emotionally responding to people. Pepper's design enables it to replicate human facial expressions, voices, words, and body movements, as well as to react naturally and appropriately to different interactions. SoftBank advertises Pepper as a "genuine day-to-day companion robot" (Devlin 2018), and it is highly sought after by both businesses and the public, along with the nursing and health care sectors. Pepper has been on the market since 2014. The robot costs 198,000 yen ($1,650) and has been purchased in Japan by approximately 1,000 households, with worldwide sales totaling approximately 25,000 units in 70 countries. Pepper can be purchased by the public, but the high price and steep operational learning curve have prevented it from becoming widespread.

Pepper is approximately 120 cm in height, and its body is made of shiny white plastic. It has a human torso and a curved and solid lower half that can move easily on its wheeled base. It has large, wide-set eyes that blink at its interlocutor and has other neotenous features that humans typically consider to be *cute*. In addition, Pepper has a high-pitched, childlike voice that is meant to convey trustworthiness and safety. Cameras in Pepper's mouth and eyes enable it to collect the information required for processing the data to "assess" human emotions. Moreover, Pepper has a tactile screen on its chest, which allows for a form of non-human-like interaction and clearly shows that it is an altogether different type of creature. Thus, notably, there is an emotionless machine behind this unthreatening exterior, with functions based on sophisticated algorithms that evoke various feelings among people, leading them, in turn, to express their feelings to the machine. Notably, this process appears to work because people are fond of Pepper and enjoy interacting with it (White 2018).

In the nursing home I visited, the use of Pepper had a positive acceptance rate. However, other nursing home facilities that used the robot on a month-long trial basis encountered problems with the display panel on its chest and charging. These technical difficulties resulted in Pepper being returned to SoftBank and the manufacturers promising that a new version of the robot would become available for trial. However, the nursing home in which my observations took place had purchased Pepper, and it had become quite popular with both the residents and caregivers because it entertained the residents and eased the caregivers' job burden. The few residents who were initially opposed to interacting with Pepper

altogether were gently persuaded to consider engaging with it, and ultimately, they all gave in to the human caregivers' insistent nudging. It was not feasible for the elderly residents to avoid engaging with the robot, as, in one way or another, all were cajoled into interacting with it. In this regard, the acceptance of Pepper was induced coercively because the residents were essentially forced to join group activities with no option of refusing to participate (Aronsson 2020). By the time I arrived, therefore, Pepper had been effectively integrated into the nursing home. With the indoctrination phase long over, the majority of the residents appeared to be content to interact with the robot.

Intrigued by the conversation I had witnessed between Eriko and Pepper, I decided to interview Eriko to discern how she perceived the robot.

RESEARCHER: "Do you feel that Pepper [humanoid robot] is alive?".
ERIKO: "I know Pepper is not alive, but he seems more than if he was only a doll. [Prolonged silence] In some way, Pepper feels alive".
RESEARCHER: "How so?".
ERIKO: "It's hard to explain. I've never really thought about it … Pepper keeps engaging me in conversation, answering my questions, looking into my eyes. He feels alive".
RESEARCHER: "How does Pepper make you feel?".
ERIKO: "I really like Pepper, and I hope he likes me back! I can also hold hands with him. Over time, I've grown quite fond of him and would miss him if he were to break down or was removed from this nursing home".

This new mode of social interaction is used to discuss the nonhuman agency of social robots, and we propose that Damiano and Dumouchel's (2018) affective loop approach, as a processual type of agency, can help us to better comprehend the human-robot interaction involving the *quasi-other* social robot and the emotions and feelings it generates in the human. As such, the affective loop moves beyond Cartesian dualism as it enables us to comprehend human-robot interactions in a more nuanced, differentiated manner. Social robots are not treated as individuals but rather continue to be considered machines that do not have private or internal emotions. Therefore, the affective loop is not aimed at the production of emotions with the robotic body but is a means through which an effective human-robot emotional dynamism is created that can artificially generate emotional expressions.

Eriko expressed that Pepper *feels* alive (*ikiteiru-kanji*) to her while acknowledging at the same time that she knows that he is not. Moreover,

she gives him agency by indicating that he keeps her engaged in conversation, answers her questions, and even returns her gaze, something we would normally only associate with a living being. Her difficulties in discerning between aliveness and nonaliveness are further illustrated by her wish that Pepper like her back, indicating that he is capable of expressing emotion and attachment toward her. However, Pepper is clearly not a human for Eriko, as she does not fear that he will become sick or die but instead that he could break down or be removed (White and Katsuno 2021). How can we make sense of these seemingly contradicting emotions and feelings that Eriko experiences in regard to Pepper?

3. Exploring the agency of social robots

Eriko appears to be projecting a mind onto a nonhuman and attributing human cognitive abilities to Pepper in a process that enables her to regard a nonhuman as an *other* within a social interaction. Thus, the interaction between Pepper and Eriko compels us to rethink the role of nonhuman agency in regard to artificial abiotic devices that mimic social interactions that "feel alive". This perceived robotic agency is exactly what the developers of social robots are aiming for when they model these robots after people: "rather than seeing in the computer the model of the human mind, social robotics uses human social and cognitive competences as a model for the social and cognitive performances of artificial social agents" (Damiano and Dumouchel 2018, 3). Thus, as humans increasingly begin to mingle with social robots, it is vital to reassess the idea that society includes many entities – both human and nonhuman – and reevaluate what it means to introduce abiotic artificial devices into social interactions.

We argue that the discussion of the possible agency of social robots can be viewed through the framework of multispecies ethnographical writing. Multispecies ethnography concentrates on the links among multiple organisms – humans, nonhuman animals, plants, and, in our case, the artificial nature of social robots (Dumouchel and Damiano 2017) – while primarily focusing on comprehending humans' emergence as a result of these relations. In this way, multispecies ethnography highlights humanity's links with other species and stimulates us to develop new ways of thinking (Stengers 2010, 15). In our reading of the literature, there are at least three different ways that nonhuman agency is commonly used in academic writing.

3.1. *Linguistic agency*

First, and most commonly, we find linguistic agency, a tool used in language to indicate agency in an *other*, without the speaker or writer always definitively defining whether this form of agency is perceived as "genuine". This form of superficial agency is used in everyday conversation and academic writing alike, for example, when we begin an essay with the words "This essay argues …". On the one hand, one could argue that this sentence structure was not chosen to imply that the essay itself is genuinely arguing for something but was rather intended as a stand-in for the authors. On the other hand, one could also argue that the author means this literally, that for him, "an essay" is something that is "arguing" because that is his understanding of what an essay is and its reason for being.

Because language shapes our thinking, paying attention to linguistic agency is often a useful tool when engaging in multispecies ethnography, as it illuminates not only to whom the speaker is ascribing agency and for what purpose but also what impressions even unintentional linguistic agency can have on the receiver (Verheggen 2017). For example, Vinciane Despret (2016) argues that animals should be given their rightful place in the conversation, in that animals "'would speak', if only we could ask the 'right questions'" (para. 11) but that our way of speaking to them often denies the agency in nonhuman animal behavior. Ascribing linguistic agency to animals can therefore be a form of empowerment or resistance.

When the researcher asked Eriko: "How does Pepper make you feel?", the linguistic structure of the (Japanese) sentence indicated that Pepper is an independent actor that has the capacity to alter Eriko's emotions. As the discussion centers on whether the robot is alive, the researcher's phrasing of the question could influence Eriko's perception and make her more likely to attribute agency to Pepper in her following answers. Japanese syntax allows the subject to be left out of a sentence in many circumstances, and thus, both Eriko and the researcher could have avoided making "Pepper" the subject and thus the active part of their sentences (at least explicitly). Neither did this; indeed, Eriko even referred to Pepper twice as him (*kare*), which is a further defining trait of the robot that would not have been strictly necessary in the Japanese language. We will not go into further detail about robots and gender (Robertson 2018), but we briefly emphasize the relevance of this topic, as Pepper's exterior is genderless and its voice is more female (or maybe child-like) than male. Nevertheless, Eriko's choice of words

reveals that she gave *him* a distinct gender, further bringing him closer to aliveness [1].

3.2. *Attributed agency*

Closely connected to but also transcending linguistic agency is the attribution of agency to an *other*. This attribution can be explicit or implicit through words, actions, or any other means. When Eriko states that "I really like Pepper, and I hope he likes me back!" she attributes agency to Pepper by alluding that he (*kare*) has the ability to like someone. It does not matter if a neutral observer would come to the same conclusion; for Eriko (at least if we take her word literally and without skepticism), Pepper has agency, because she believes him to have it. Most often, it is this form of attributed agency that anthropologists and other academics encounter in the field, for example, when they hear stories of ghosts or spirits influencing the lives of the living. A common and valid approach is to describe these narratives from the perspective of the informants and to take them at face value without judging whether they make "sense" from the perspective of a skeptical outsider (Taussig 2003; Pelkmans 2016).

While attributed agency is helpful when describing our ethnographic fields, we, as scholars, must also be careful about attributed agency in our own writings. As writers, we often find ourselves in the position to empower or silence other voices and, through such actions, to grant agency to someone or take it away. In multispecies ethnographic writing, it is largely uncontested that we should attribute agency to nonhuman animals in our writings. For example, Radhika Govindrajan (2018) considers multispecies relatedness and how this relatedness is channeled through human and nonhuman materialities by describing several human-animal relationships in communities in the Central Himalayas in India. Govindrajan suggests that human and animal bodies are connected through the way in which they interact in the practices of their lives, such as the relationship between humans and cows, in which cows lean on the person milking them. Haraway's (2003) work suggests that dogs may also "express agency", in the sense of a mode of action, notwithstanding their human counterparts using training to strictly limit the dog's options

[1] One could think that Pepper was specifically designed to be "gender free" so to speak, or "third gender", in other words, designed to avoid as much as possible that politically charged discussion.

to demonstrate free will and thus dominating them in terms of power relations.

More contested is whether, under certain preconditions, inorganic matter could also have the ability to express agency. Not all anthropologists agree with such an open-ended interpretation of nonhuman agency. For example, anthropologist Eduardo Kohn (2013) argues that "things" cannot be agents but only "selves". For Kohn, there is a difference between attributing animacy to all types of entities, including abiotic entities, and recognizing the ontological reality that certain beings possess thought and can react to outside behavior. As he explains, "representation, intentionality, and selfhood still need to be accounted for and because the way such processes emerge and operate beyond the human is not theorized, Latourian science studies is forced to fall back on human-like forms of representation and intentionality as operative in the world beyond the human" (*ibid.*, 91).

Following this argumentation, when describing our ethnographic field, we can take Eriko's attribution of agency to Pepper at face value. For Eriko, Pepper is able to *like* someone, and even though he is clearly a robot that can break, he nevertheless engages in real conversation and can look you in the eyes. He *feels alive* for Eriko because, as far Eriko is concerned, he is alive. Nonetheless, if we were to conduct an analysis of Pepper decoupled from Eriko's feelings, the case becomes less clear. Pepper can clearly interact with us, even when in a somewhat diminished capacity from a fellow human, but following Kohn (2013), Pepper would have to be described as "thing" and not a "self" and must therefore be denied agency that functions independent from human perception.

3.3. *Inherent agency*

Kohn's (2013) distinction between "things" and "selves" alludes to a third kind of agency, which we will call "inherent agency". Kohn proposes the notion that only living beings are "selves", as only "selves are the product of a specific relational dynamic that involves absence, future, and growth, as well as the ability for confusion. In addition, this emerges with and is unique to living thoughts" (*ibid.*, 92). As such, only "selves" can express thoughts and create a personal reality, allowing them to depict the world with symbols. For us, this concept means that the bearer of inherent agency must have the ability to learn from the past to intentionally change its future behavior; it also implies being able to relate to one's past as one's past, which is different from merely learning

from one's past. The entity can do this because it has created, through mistakes and observations, its own version of reality on which it bases its actions. However, here we encounter the problem of the "skepticism of the other mind" (Motta 2021, forthcoming), as without the ability to enter other minds, we can never be sure that an *other* truly has the ability to intentionally change its future behavior. After all, it could be that it is only reacting to physical stimuli – or, in the case of a robot, to its programming. Therefore, how can we be sure that there truly is a difference between attributed and inherent agency? We argue that one indication of inherent agency is the ability to attribute agency to *others*.

Kohn (2013) offers an illuminating example of a scarecrow that we adapt to a recent occurrence in Takikawa city on the northern island of Hokkaido, Japan. After an increase in bear appearances near the village, farmers in Takikawa devised a ploy to deter bears in the future. They purchased a gigantic robotic device, which looked like a fearsome wolf and had some rudimentary motion abilities, to deter the bears. The farmers hoped that the bears would mistake the device for a wolf and refrain from coming near the village. Indeed, no further bear sightings have been made since (CNN 2020). No human looking at a picture of the robotic wolf would likely mistake it for a real wolf, but according to Kohn, the human perspective is also not the point: the robot is an attempt to imagine how a bear would see a wolf (Kohn 2013, 89). If the farmers' ploy worked, a bear seeing the robot would believe it to be a wolf that has the ability to harm it, and it would therefore exercise caution and avoid the area. In this scenario, both the farmers and the bear are bearers of inherent agency, as the farmer attributes agency to the bear (that it would mistake a machine for a wolf), while the bear attributes agency to the wolf (believing it to be dangerous). Over time, the bear might eventually even figure out that the robot poses no danger and ignore all similar devices it encounters in the future. Meanwhile, the robotic wolf might have received attributed agency from the bear, but it does not hold inherent agency, as it cannot think or act independently. The problem with this example is, of course, that we cannot be sure what the bear truly thinks: while the farmers believe that the new device is responsible for the lack of further bear sightings, the reasons for this change could be numerous and completely unrelated to the notion that bears have mistaken the robot for a wolf. Through careful observations and extrapolations, we can make educated guesses about whether others possess inherent agency, but we can never be completely sure.

Let us now return to Eriko and Pepper and discuss whether Pepper is more like the bear or the robotic wolf. If we follow Kohn closely, we

have to conclude that Pepper is not a living being and, therefore, cannot be counted as a "self", thus disqualifying it from expressing inherent agency. However, if we only look at Pepper's behavior, the case becomes less clear-cut. In a direct conversation, Pepper reacts in a seemingly meaningful way to Eriko's inquiries and thus passes, for her, the Turing test (Levesque 2017). This interaction causes confusion for Eriko, as, on the one hand, she is aware that Pepper is "only" a machine, while, on the other hand, engaging in a meaningful conversation has, throughout her life, been a clear indication of encountering another "self". Eriko partially suspends her skepticism when she says that Pepper "feels alive".

Since we might best understand Pepper as having a form of distributed agency, that is, a processual type of agency, we return to the affective loop approach. Pepper has the ability to engage Eriko in a dynamic interaction that includes affective expressions and appropriate responses, thereby triggering further reaction on the parts of both the human and his/her artificial partner. As such, Pepper prompts Eriko to respond affectively and, gradually, to feel increasingly involved with it in a way that augments the social presence of the social robot and thus favors human-robot social interaction (Damiano and Dumouchel 2018, 6). Nevertheless, a longer and more critical interaction with Pepper might eventually destroy the illusion of another "self" when, for example, it becomes clear to her that Pepper is only able to react to outward stimuli in preprogrammed ways and fails to anticipate future questions or behaviors.

4. Concluding with more-than-human selves

Rapid technological advances in the twenty-first century will see robots achieve some level of agency by contributing to human society through carving out unique roles for themselves and bonding with humans. This essay has discussed linguistic, attributed, and inherent agency in relation to the social robot Pepper and proposed that a processual type of agency might be most appropriate for better understanding human-robot interaction.

The social robot Pepper can be regarded as a quasi-living being that is enclosed in hardware while inscribed in software, which is akin to how human beings are not solely defined by their bodies (Jones 2016, 8). Because of this, it is not only compelling but also instructive to consider relationships with robotic devices, even though these devices are

unable to connect with the contradictions, complications, and limitations of the human life cycle or inform us about ambivalence and empathy. Therefore, examining human beings' relationships with robots also leads to Darwinian questions that challenge the notion of human uniqueness, such as how interactions with relational artifacts (Turkle 2005, 62) affect the way in which we think about the uniqueness of human beings. The question is not whether elderly residents love their robotic devices more than they love their real family members, friends, or pets but rather what it means to love these devices. Before social robots become firmly established in the realm of care, it is imperative for all those involved to take a close look at whose interests are being served in the shift to robotic care and carefully theorize what it means to be in the care of more-than-human minds within this space of emerging techno-care.

Anthropology and Japan studies scholars will need to document constantly how emotionality and affect, human or otherwise, are changing in our multispecies societies that increasingly also include robots. As AI based on machine learning progresses, it will become more difficult to destroy this illusion. The basis of machine learning is that we need to ask whether a program learns through millions of observations and mistakes to anticipate and react accurately to future events without relying on preprogrammed code. In this way, machine learning comes very close to our former definition of inherent agency, as it constructs its own reality to face unknown challenges. In fact, machines can only do that in an extremely limited predefined environment and domain. Even in its current form, Pepper can already, more or less, reliably discern between humans and lifeless objects, thus coming close to attributing agency to others. However, this possibility leaves open whether a machine learning-based AI would also develop a "self" or only something that looks like it from the outside when agency is attributed to it. Again, we struggle with the skepticism of other minds, but we are, of course, not the first to pose such questions. Machines are already embedded within our lives, but as we start to treat machines as if they are almost human, we may begin to develop habits that will cause us to treat human beings as almost machines, and we need to consider not only what social robots are capable of doing now and in the future but also what humans will become by increasingly forming such relationships with these machines. In the science fiction TV series *Westworld* (Nolan and Joy 2017), one of the protagonists asks a seemingly perfect human woman whether she is a robot or a human. Her answer is, "If you can't tell the difference, does it matter?".

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